



National Transportation Safety Board

NTSB Efforts to Enhance Safety: Reducing Distraction and Fatigue in Transportation

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Federal Agencies: Transportation

NTSB

FMCSA

FRA

NHTSA

PHMSA

DOT

MARAD

FTA

FHWA

FAA



NTSB



- 1) determining the probable cause of transportation accidents**
- 2) making recommendations to prevent their recurrence**



NTSB



All Modes



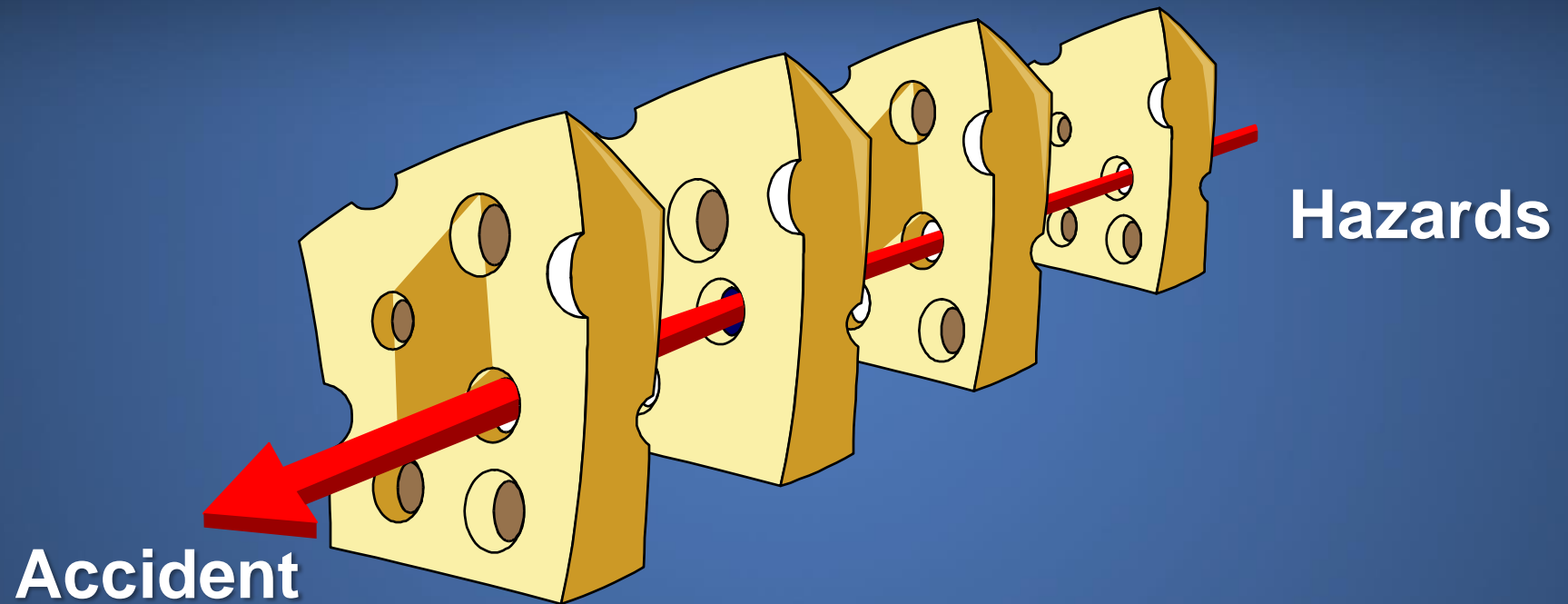
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Independent Federal Agency: Created in 1967

- >140,500 accident investigations
- 14,000+ safety recommendations
- ~ 2,300 organizations/recipients
- 82% acceptance rate



“Swiss Cheese” Model (Reason)



Successive layers of defenses, barriers, and safeguards



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Distraction: 12+ Years of NTSB Investigations



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**Ford Explorer Sport Collision
With Ford Windstar Minivan
and Jeep Grand Cherokee
on Interstate 95/495
Near Largo, Maryland
February 1, 2002**



Highway Accident Report
NTSB/HAR-03/02

PB2003-916202
Notation 7561



**National
Transportation
Safety Board**
Washington, D.C.



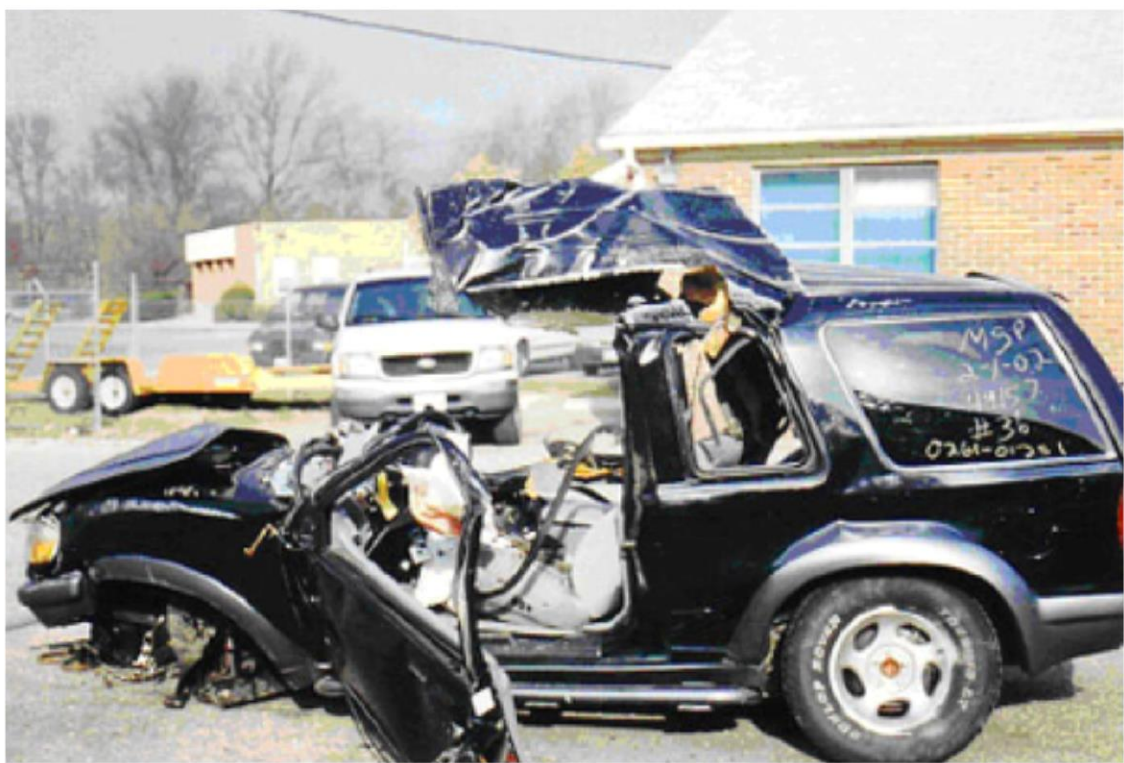
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Largo, MD (February 1, 2002)

- 20 year old driver
- SUV driver's handheld cell phone found
- Wireless records showed:
 - starting at 4 pm, driver placed/received 15 calls
 - 12 to/from friend's wireless number
 - call #15 at 8 pm (accident occurred ~ 8 pm)



5 fatalities
1 injury



SUV



minivan



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Probable Cause

“ . . . failure to maintain directional control . . .
due to a combination of . . . and distraction caused
by use of a handheld wireless telephone.”



Recommendations

To the National Highway Traffic Safety Administration:

Develop, in conjunction with The Advertising Council, Inc., a media campaign stressing the dangers associated with distracted driving. (H-03-03)

Develop, in conjunction with the American Driver and Traffic Safety Education Association, a module for driver education curriculums that emphasizes the risks of engaging in distracting behavior. (H-03-04)

Determine the magnitude and impact of driver-controlled, in-vehicle distractions, including the use of interactive wireless communication devices, on highway safety and report your findings to the U. S. Congress and the States. (H-03-05)

To the 48 States that do not have legislation prohibiting holders of learner's permits and intermediate licenses from using interactive wireless communication devices:

Enact legislation to prohibit holders of learner's permits and intermediate licenses from using interactive wireless communication devices while driving. (H-03-08)

To the 34 States that do not have driver distraction codes on their traffic accident investigation forms:

Add driver distraction codes, including codes for interactive wireless communication device use, to your traffic accident investigation forms. (H-03-09)

To the American Driver and Traffic Safety Education Association:

Develop, in conjunction with the National Highway Traffic Safety Administration, a module for driver education curriculums that emphasizes the risks of engaging in distracting behavior. (H-03-10)



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Alexandria, VA (November 14, 2004)



11 injuries



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Probable Cause

“ . . . bus driver’s failure to notice and respond to posted low-clearance warning signs and to the bridge itself due to cognitive distraction resulting from conversing on a hands-free cellular telephone while driving.”



Truck-Tractor Semitrailer Median Crossover
Collision With 15-Passenger Van
Munfordville, Kentucky
March 26, 2010



Accident Report

NTSB/HAR-11/02
PB2011-916202



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Munfordville, KY (March 26, 2010)

- truck-tractor semitrailer combination unit
- departed the left lane of southbound Interstate 65
- crossed a 60-foot-wide median
- struck and overrode a cable barrier system
- entered the northbound travel lanes
- struck a 15-passenger van
 - 11 passengers (eight adults, two children, infant)



Munfordville, KY (March 26, 2010)

- driver used his mobile phone for calls and text messages a total of 69 times while driving in the 24-hour period prior to the accident
- driver made four calls in the minutes leading up to the crash
- last call at 5:14 a.m. CDT, coinciding with the time that the truck departed the highway





- crossed 60 ft median
- overrode cable barrier

Fatalities

- truck driver
- van driver
- 9 van passengers



Probable Cause

“ . . . the truck driver’s failure to maintain control of the truck-tractor combination vehicle because he was distracted by use of his cellular telephone.”



Multivehicle Collision
Interstate 44 Eastbound
Gray Summit, Missouri
August 5, 2010



Accident Report

NTSB/HAR-11/03
PB2011-916203



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Gray Summit, MO (August 5, 2010)

- pickup driver cell phone use:
 - 11 minutes prior to accident,
11 text messages (6 sent/5 received)
- witness: driver appeared to lean to right
- witness: did not see brake lights illuminate
- pickup's sensing and diagnostic module (SDM):
 - brakes not applied in seconds before impact





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2 fatalities
37 injuries



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New Recommendations

To the 50 states and the District of Columbia:

(1) Ban the nonemergency use of portable electronic devices (other than those designed to support the driving task) for all drivers;



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Fatigue is a safety risk.



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Miami, Oklahoma (June 26, 2009) Fatigue Factors

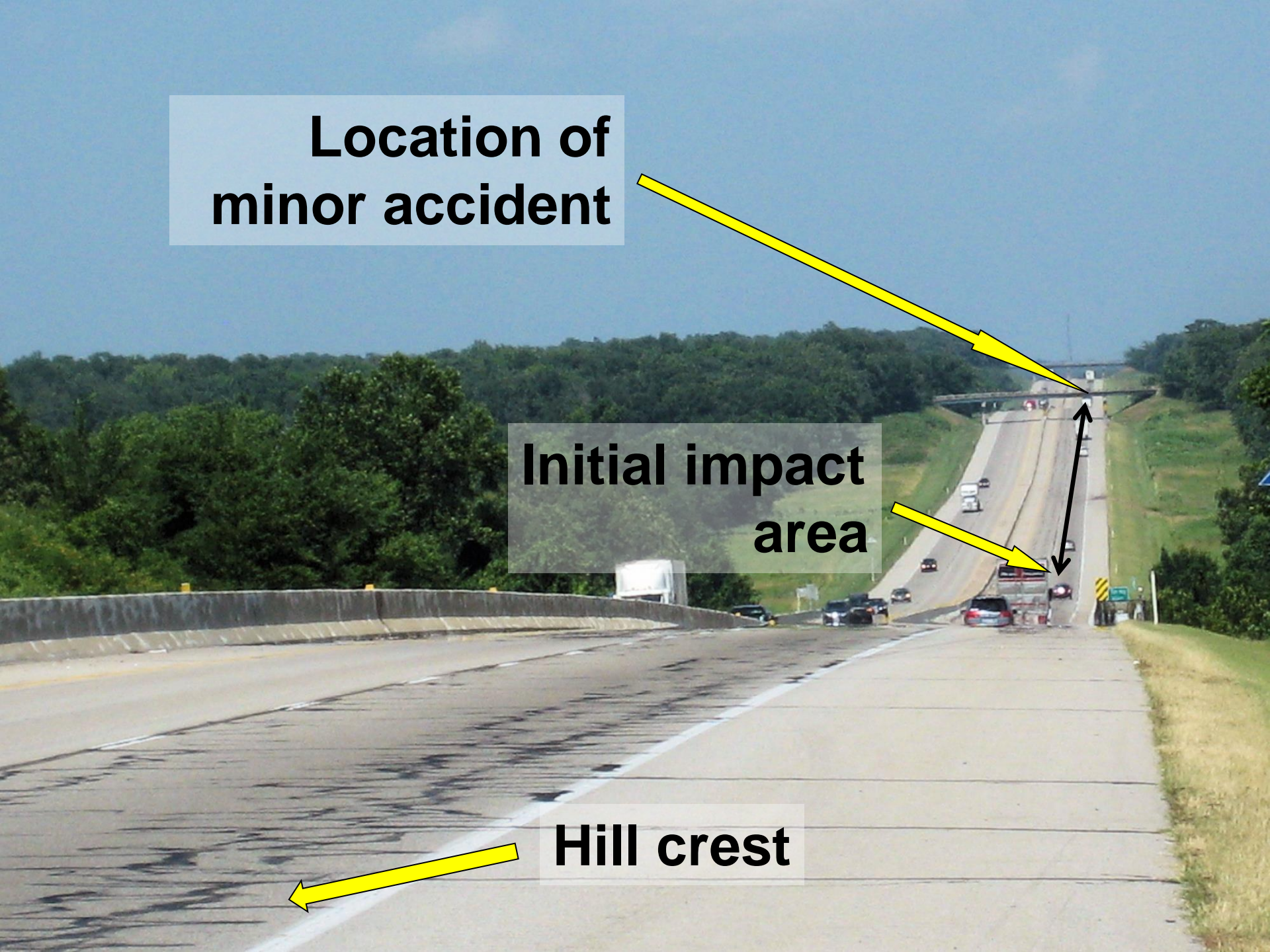
- Off work for 3 weeks: day active/night sleep schedule
- 3am to 3pm shift work/drive schedule (since 1997)
- Early bedtime (2 hr phase advance in sleep time)
- Obtained min 3 hrs/max 5 hrs sleep prior to accident
- Subsequently diagnosed with mild sleep apnea



**Location of
minor accident**

**Initial impact
area**

Hill crest



Miami, OK (June 26, 2009)

10 fatalities
3 serious injuries
2 minor injuries
5 no injuries



Probable Cause (fatigue)

“ . . . driver’s fatigue, caused by the combined effects of acute sleep loss, circadian disruption associated with his shift work schedule, and mild sleep apnea, which resulted in the driver’s failure to react to slowing and stopped traffic ahead by applying the brakes or performing any evasive maneuver to avoid colliding with the traffic queue. . . . ”





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Animation of Accident Reconstruction

Motorcoach Run Off Road-Collision with Bridge Signpost

Interstate Highway 95 Southbound
New York, New York
March 12, 2011

HWY11MH005

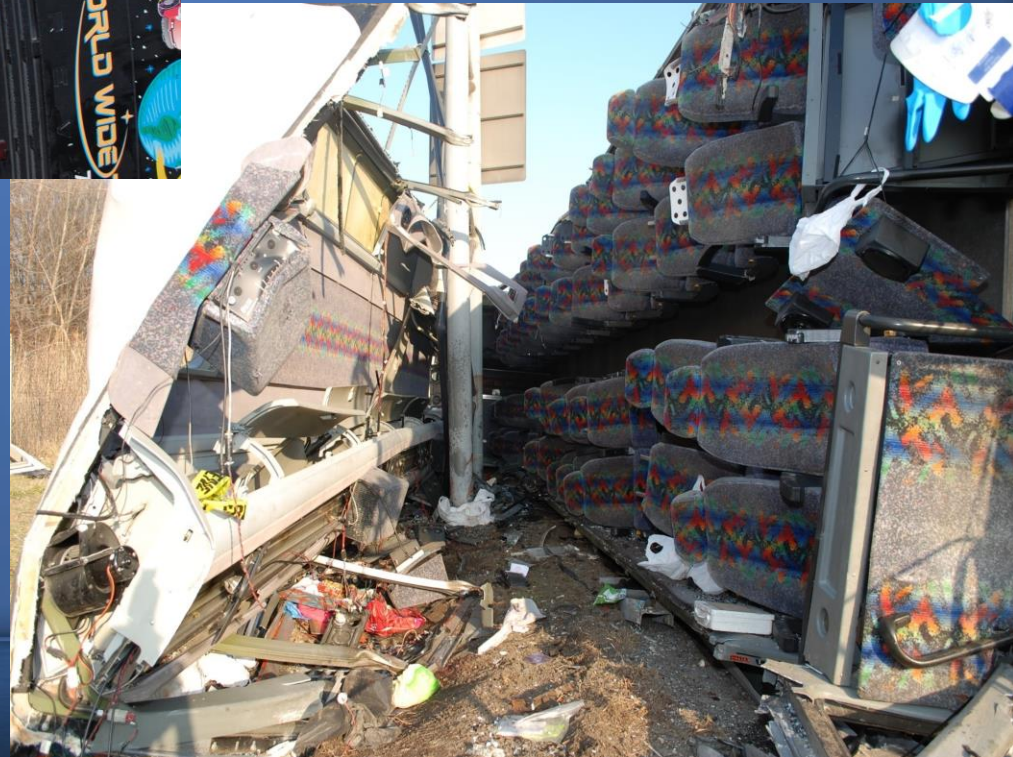


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'Bronx Bus', New York, NY (March 12, 2011)



15 fatalities
17 injuries

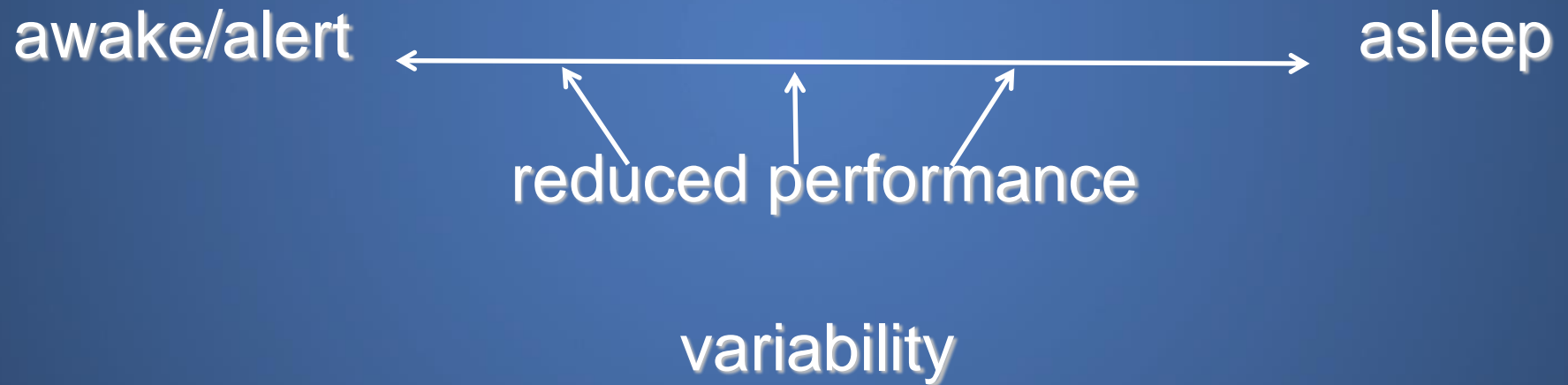


Probable Cause

“The National Transportation Safety Board determines that the probable cause of the accident was the motorcoach driver's failure to control the motorcoach due to fatigue resulting from failure to obtain adequate sleep, poor sleep quality, and the time of day at which the accident occurred.”



Fatigue Risks



Fatigue Risks

- degraded 20 – 50%+:

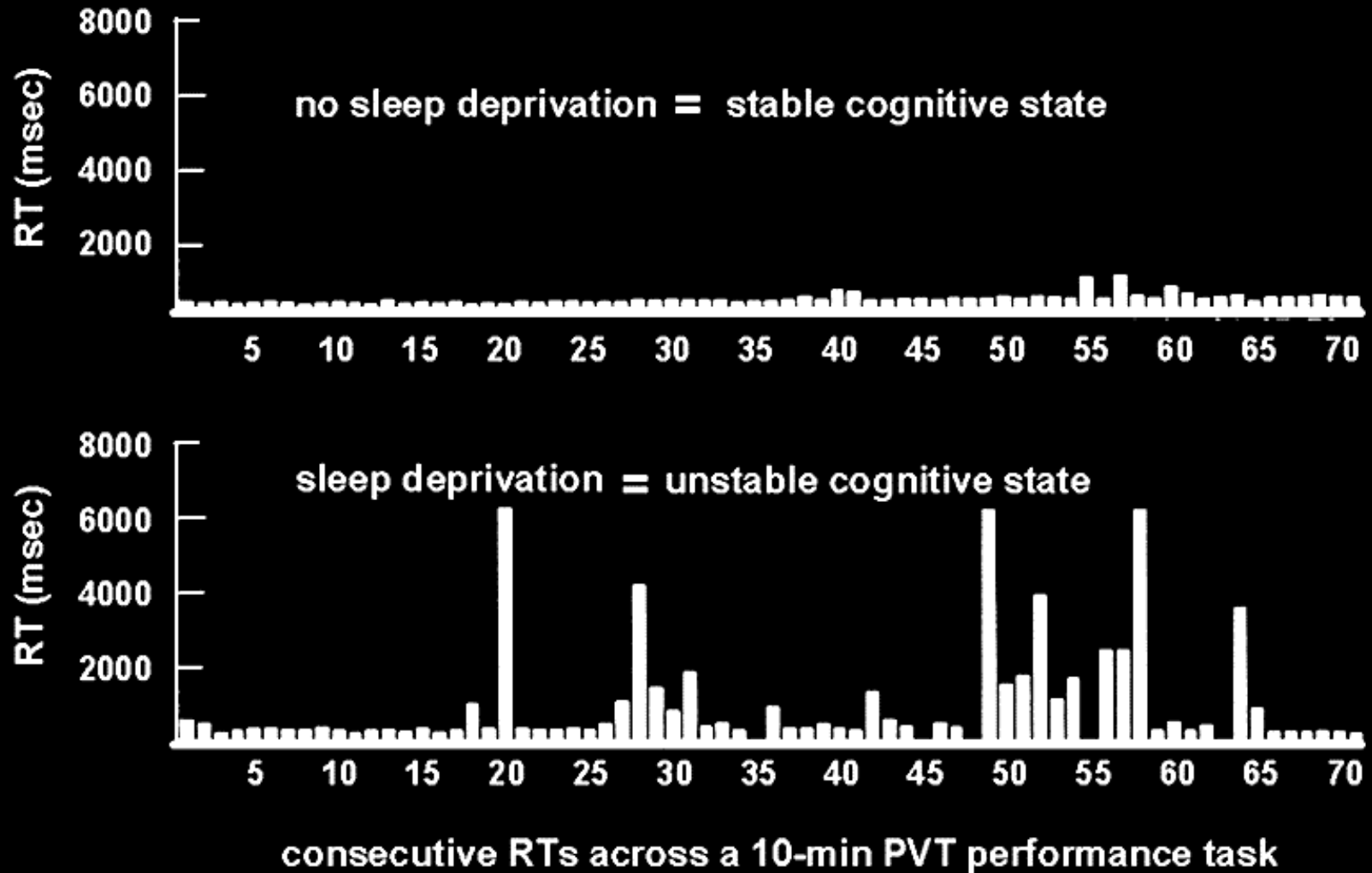
- reaction time
- memory
- communication
- situational awareness
- judgment
- attention
- mood

- increased:

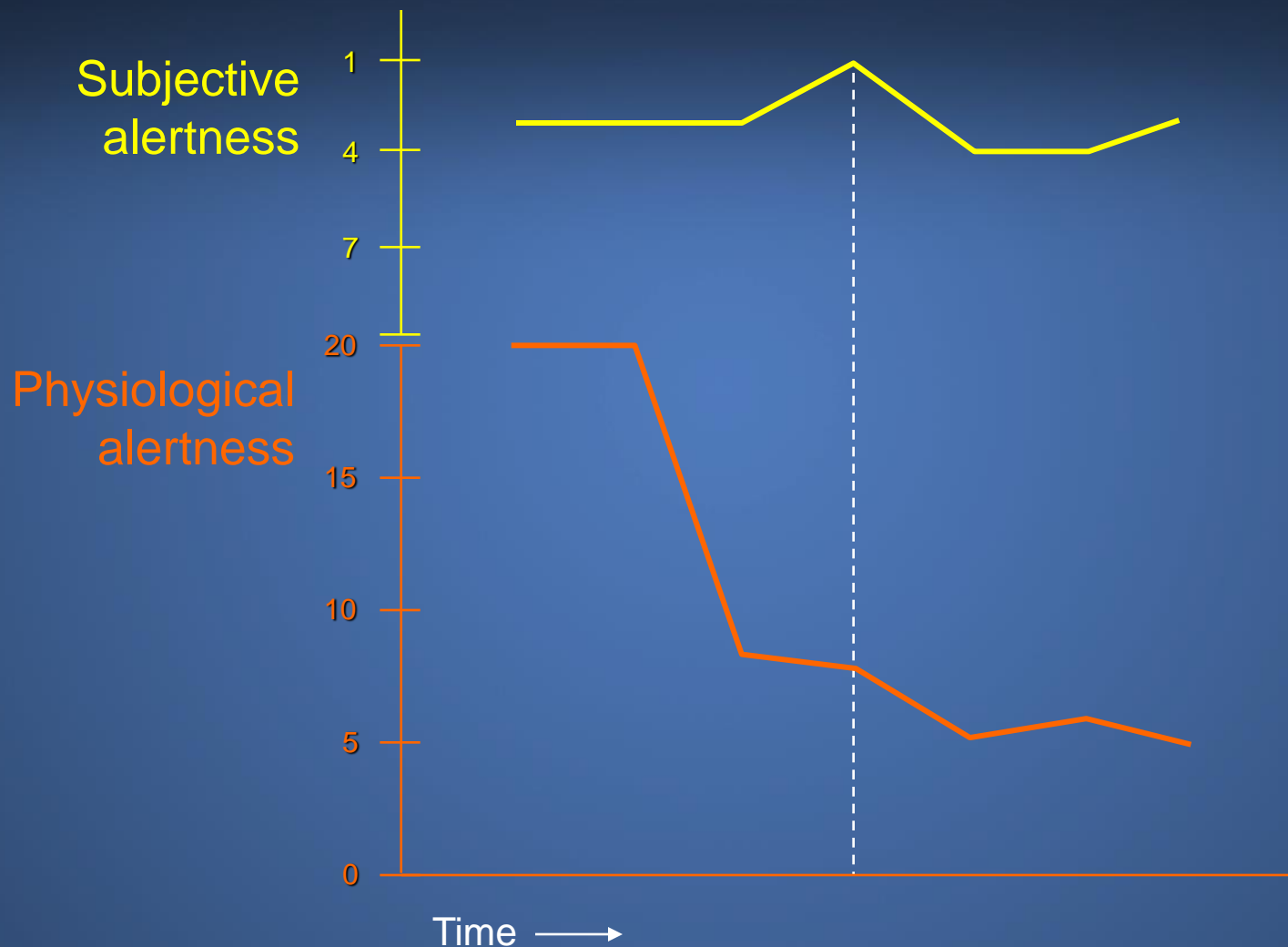
- irritability
- apathy
- attentional lapses
- microsleeps



Fatigue and Reaction Times



Alertness Reports Often Inaccurate



Adapted from Sasaki et al., 1986



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MOST WANTED LIST

A program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives. The following are ten of the current issues.



Addressing Human
Fatigue



General Aviation
Safety



Safety Management
Systems



Runway Safety



Bus Occupant Safety



Pilot & Air Traffic
Controller
Professionalism



Recorders



Teen Driver Safety



Addressing Alcohol-
Impaired Driving



Motorcycle Safety



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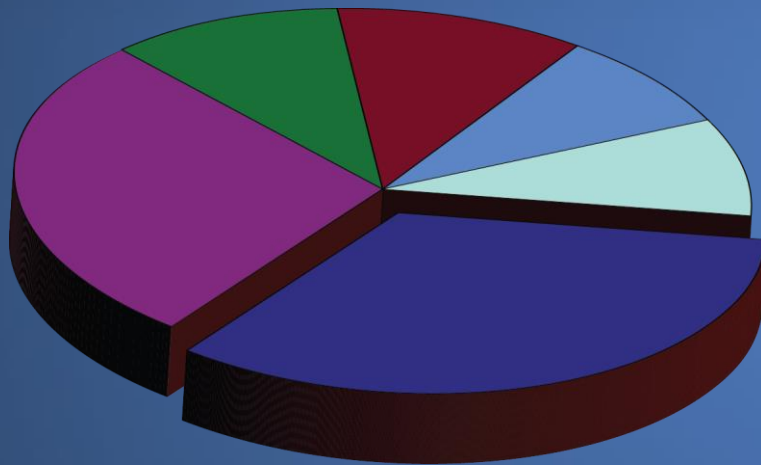
NTSB Safety Recommendations: Fatigue

- MOST WANTED 1990 - 2011
- ~200 fatigue recommendations



Complex Issue:

Requires Multiple Solutions



- Scheduling Policies and Practices
- Education/Awareness
- Organizational Strategies
- Healthy Sleep
- Vehicle and Environmental Strategies
- Research and Evaluation



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